Poster

The Application of Borehole Geophysical Logging Techniques at a Small Municipal Landfill in Asotin County, Washington

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The availability of new portable slim-hole geophysical logging systems has added a new and important dimension to hydrogeological site characterizations. In this site investigation, a two-phase approach using natural gamma, induction, temperature, and the heat pulse flow meter logs were used to examine existing wells and define the site hydrostratigraphy for a small municipal solid waste landfill in Asotin County, Washington. In addition, the application of borehole geophysics at this site allowed critical field decisions, i.e., well screen placement to be made with more accuracy and certainty and helped eliminate errors at the time of drilling about lithologic boundary changes.

In contrast to the high cost of drilling and well placement, on the order of tens-of-thousands of dollars per drilling location, borehole geophysical logging including computer, log analysis software, winch, probes, printer, and overnight shipment cost less than 1 percent of the total cost of the drilling investigation. Mobilization and drilling standby time were less than one hour per logging run and did not require a commercial operator-expert. Thus, the advancements in ultra-portable logging has produced an economical technology that should be common place in most site investigations.

Although Washington state has not had the large commercial logging bases as oil-producing states, it is time to revolutionize the way traditional site investigations are conducted. Currently, the new municipal solid waste landfill regulations in Washington state encourage the use of geophysical methods for site investigations by allowing some substitution of the minimum boring numbers providing appropriate geophysical techniques are used. The intent here, is to put more emphasis on the quality of site hydrogeologic characterizations while at the same time lower owner/operator costs. The application of ultra-portable borehole geophysical logging should set us on that new course.

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